

CLAIMS

1. Process for manufacturing a mat whereby at least one first layer or series of layers of strand(s) formed of filaments and at least one second layer or series of layers of strand(s) formed of filaments are deposited on at least one moving conveyor, **characterized in that** at least some of the strand(s) of the first layer or series of layers are opened before the first layer or series of layers and the second layer or series of layers are superposed.
2. Process according to Claim 1, whereby the strands are continuous strands.
3. Process according to Claim 1, whereby the strands are, at least in the case of some of them, chopped strands.
- a 4. Process according to ~~one of Claims 1 to 3~~, whereby the strands are formed of reinforcing filaments, preferably glass filaments, and/or filaments made of an organic material.
- a 5. Process according to ~~one of Claims 1 to 4~~, **characterized in that** the strands are opened mechanically under the action of a cascade and/or of jets of fluid arriving transversely on the strand(s) of the first layer or series of layers on the conveyor.
- a 6. Process according to ~~one of Claims 1 to 5~~, **characterized in that** the strand or strands of the first layer or series of layers, during or after opening, pass through a bath which encourages their constituent filaments to disperse.
- 25 a 7. Process according to ~~one of Claims 1 to 6~~, **characterized in that** the strand or strands of the first layer or series of layers are opened by a fluid comprising a liquid binder.
- a 8. Process according to ~~one of Claims 1 to 7~~, **characterized in that** a binder in powder form is poured onto the superposed layers of strand(s).
9. Process according to Claim 8, **characterized in that** the strands are re-humidified just before and/or just after the powder-form binder is deposited.
- a 35 10. Process according to ~~one of Claims 7 to 9~~, **characterized in that** the superposed layers of strand(s) are introduced into a device for melting and/or polymerizing and/or cross-linking the binder.
11. Process according to Claim 10, **characterized in that** the superposed layers of strand(s) are dried before being

introduced into a device for melting and/or polymerizing and/or cross-linking the binder.

a 12. Process according to ~~one of Claims 1 to 11~~, ^{Claim 1} characterized in that the strand or strands of the first layer or

5 series of layers are opened on a first conveyor then introduced onto a second conveyor on which they are covered with the strand(s) of the second layer or series of layers.

a 13. Process according to ~~one of Claims 1 to 12~~, ^{Claim 1} characterized in that the strand or strands of the first layer or

10 series of layers are turned before being introduced onto the second conveyor.

a 14. Process according to ~~one of Claims 1 to 13~~, ^{Claim 1} characterized in that each layer of strand(s) comes from a bushing and/or an extruder and/or from (a) winding(s).

15 15. Device for implementing the process, this device comprising:

- a first device or series of devices for supplying a first layer or series of layers of strand(s) formed of filaments,

20 - a second device or series of devices for supplying a second layer or series of layers of strand(s) formed of filaments,

- at least one conveyor intended to receive the first layer or series of layers and the second layer or series of layers,

25 - and at least one device for opening strands which is located downstream of the first supplying device or series of supplying devices and upstream of the point of the conveyor at which the first layer or series of layers and the second layer or series of layers are superposed.

16. Device according to Claim 15, characterized in that the device for opening the strands has an opening at its top allowing the continuous escape of a fluid supplied continuously to the device, this fluid flowing along a vertical wall at the base of the opening device.

35 17. Mat comprising one or more layer (layers) of integrated strand(s) and one or more layer (layers) of strand(s) at least partly opened in the form of filaments and capable of being obtained according to the process of ~~one of Claims 1 to 14~~. ^{Claim 1}

18. Mat comprising one or more layer (layers) of integrated strand(s) and one or more layer (layers) of strand(s) at least partly opened in the form of filaments, the latter layer or layers

having a filament dispersion gradient.

19. Mat according to Claim 18, whereby the strands are formed of reinforcing filaments, preferably glass filaments, and/or filaments of an organic material.

5 a 20. Mat according to ~~one of claims 18 and 19~~, whereby the strands are continuous strands.

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21. Composite comprising at least one organic material and/or one inorganic material and comprising at least reinforcing strands, **characterized in that** it comprises at least one mat

10a according to ~~one of claims 17 to 20~~.